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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/721,662	11/25/2003	Taner Tuken	29766-70636	5955

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BARNES & THORNBURG  
11 South Meridian Street  
Indianapolis, IN 46204

EXAMINER

MCCALL, ERIC SCOTT

ART UNIT	PAPER NUMBER
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2855

DATE MAILED: 02/01/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/721,662

Applicant(s)

TUKEN ET AL.

Examiner

Eric S. McCall

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-61 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 61 is/are allowed.
- 6) ☒ Claim(s) 1-4, 6, 8, 9, 15-17, 22, 23, 26-35, 46-48, 55 and 58-60 is/are rejected.
- 7) ☒ Claim(s) 5, 7, 10-14, 18-21, 24, 25, 36-45, 49-54, 56 and 57 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 05 February 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date ____. | 6) <input type="checkbox"/> Other: ____.  |

**SYSTEM FOR ESTIMATING A QUANTITY OF  
PARASITIC LEKAGE**

**FIRST OFFICE ACTION**

**TITLE**

The title of the invention is objected to because it is not descriptive of the claimed invention. A new title is required that is clearly indicative of the invention to which the claims are directed. The following title is suggested: SYSTEM FOR ESTIMATING A QUANTITY OF PARASITIC LEAKAGE FROM A FUEL INJECTION SYSTEM

**SPECIFICATION**

The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. The Applicant's cooperation is requested in correcting any errors of which the Applicant may become aware of in the specification.

**CLAIMS**

**35 U.S.C. § 102**

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-4, 15-17, 22, 23, 26-35, 46-48, 55, and 58-60 are rejected under 35 U.S.C. 102(b) as being anticipated by Antonioli et al. (5,773,716).

With regards to claim 1, Antonioli et al. teach a system for estimating parasitic fuel leakage from a fuel injection system for an internal combustion engine, the parasitic fuel leakage corresponding to a leakage of a fuel from the fuel injection system when no fuel is being supplied to, or drawn from, the fuel injection system, the fuel injection system including a fuel collection unit fluidly coupled to at least one fuel injector associated with the engine, the system comprising:

a pressure sensor (26) producing a pressure signal indicative of fuel pressure within the fuel injection system (abstract);

means for determining an engine operating condition (ie. engine speed and position; col. 2, line 61 to col. 3, line 3); and

a control circuit configured to estimate a quantity of parasitic fuel leakage as a function of the pressure signal and the engine operating condition (col. 3, lines 10-25).

With regard to claims 2-4, Antonioli et al. teach the claimed subject matter thereof (26, Fig. 1).

With regards to claim 15, the teaching of Antonioli et al. is interpreted as suggesting the claimed subject matter thereof (col. 3, lines 10-25).

With regards to claim 16, the teaching of Antonioli et al. is interpreted as suggesting the claimed subject matter thereof (col. 4, lines 45-57).

With regards to claim 17, since Antonioli et al. continuously measures the pressure, a change in pressure value is determined.

With regards to claim 22, Antonioli et al. teach a fuel supply (7) having stored therein a quantity of the fuel; a fuel pump (8) fluidly coupled to the fuel supply and fluidly coupled to the fuel injection system (1), the fuel pump configured to pump the fuel from the fuel supply to the fuel injection system in response to a trigger signal and to discontinue pumping the fuel to the fuel injection system in response to a stop signal; wherein the control circuit is configured to produce the stop signal in response to the motoring condition (Fig. 1).

With regards to claim 23, Antonioli et al. suggest that the change in pressure value is converted to a predetermined data format as claimed because the Applicant has not defined in the claim the meaning of the predetermined data format.

With regards to claim 26, the high pressure pump (10) of Antonioli et al. is interpreted as a fuel accumulator as claimed.

With regards to claim 27, Antonioli et al. teach a fuel rail (9) as claimed.

With regard to claims 28 and 29, Antonioli et al. teach a fault value being produced if the estimated quantity of parasitic fuel leakage is greater than a threshold value (col. 4, lines 32-43).

With regards to claim 30, Antonioli et al. teach a method for estimating a quantity of parasitic fuel leakage from a fuel injection system for an internal combustion engine, the parasitic fuel leakage corresponding to a leakage of a fuel from the fuel injection system when no fuel is being supplied to, or drawn from, the fuel injection system, the fuel injection system including a fuel collection unit fluidly coupled to at least one fuel injector associated with the engine, the method comprising the steps of:

hydraulically locking the fuel injection system (ie. closing the fuel injectors);

determining a pressure value indicative of fuel pressure within the fuel injection system

(abstract);

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determining an engine operating condition (ie. engine speed and position; col. 2, line 61 to col. 3, line 3); and

estimating the quantity of parasitic fuel leakage as a function of the engine operating condition and the pressure value (col. 3, lines 10-25).

With regard to claims 31 and 32, Antonioli et al. teach cutting off the supply of fuel at the fuel pump to the fuel injectors (col. 6, lines 28/29).

With regard to claims 33-35, Antonioli et al. teach the claimed subject matter thereof (26, Fig. 1).

With regards to claim 46, the teaching of Antonioli et al. is interpreted as suggesting the claimed subject matter thereof (col. 3, lines 10-25).

With regard to claims 47 and 48, since Antonioli et al. continuously measures the pressure, a change in pressure value is determined.

With regards to claim 55, Antonioli et al. suggest that the change in pressure value is converted to a predetermined data format as claimed because the Applicant has not defined in the claim the meaning of the predetermined data format.

With regard to claims 58-60, Antonioli et al. teach a fault value being produced if the estimated quantity of parasitic fuel leakage is greater than a threshold value (col. 4, lines 32-43).

Obviousness Type Double Patenting

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

Claims 1, 2, 6, 8, 9, and 15 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 6 of U.S. Patent No. 6,823,834. Although the conflicting claims are not identical, they are not patentably distinct from each other.



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With regards to claim 1, said claim is much broader in scope than claim 6 (which includes the subject matter of claims 1, 2, 3, and 5) of said patent. As such, claim 6 includes the claimed subject matter of claim 1.

With regards to claim 2, the claim combination of claims 6/5/3/2/1 (see col. 45, lines 16/17) of said patent claims the subject matter thereof.

With regards to claim 6, claim 6 of said patent claims the subject matter thereof.

With regards to claim 8, claim 8 of said patent claims the subject matter thereof.

With regards to claim 9, claim 7 of said patent claims the subject matter thereof.

With regards to claim 15, claim 6 claims the subject matter thereof.

Allowable Subject Matter

Claims 5, 7, 10-14, 18-21, 24, 25, 36-45, 49-54, 56, 57 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims because the prior art fails to teach or suggest the following:

A control circuit configured to multiply the quantity of parasitic fuel leakage by an engine speed ratio corresponding to a calibration engine speed divided by a measured engine speed of the internal combustion engine as claimed in claims 5 and 36.

Data table mapping values as claimed in claim 7.

Fuel injection system temperature determining means as claimed in claim 10.

The control circuit configured to determine a bulk modulus value of the fuel and estimate the quantity of parasitic fuel leakage based on the change in pressure value and the bulk modulus value as claimed in claims 18 and 49.

The predetermined data format as claimed in claims 24, 25, 56, and 57.

The engine temperature determining as claimed in claim 37.

Claim 61 has been found to be allowable over the prior art because the prior art fails to teach or suggest a method for estimating a quantity of parasitic fuel leakage from a fuel injection system comprising the steps of:

determining a bulk modulus value of the fuel based on the temperature value and the pressure value; and


estimating the quantity of parasitic fuel leakage based on the change in pressure value and the bulk modulus value.

**CONTACT INFORMATION**

Any inquiry concerning this communication or earlier communications from the Examiner should be directed to Eric S. McCall whose telephone number is (571) 272-2183.

The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

  
Eric S. McCall  
Primary Examiner  
Art Unit 2855  
Jan. 28, 2005